SLGS NEWSLETTER

SRI LANKAN GEOTECHNICAL SOCIETY

A Member Society of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)

Established in 1986

2021 December: No 21

Message from the Editor

Dear Readers,

I would like to wish you a Very Happy New Year (2022), on behalf of the SLGS Executive committee.

It is with a great pleasure I inform you that the International Conference on Geotechnical Engineering (ICGE-2020-Colombo) was successfully held on 6 and 7 December 2021 on an online platform. The organizing committee conducted the conference from Cinnamon Grand in Colombo.

The AGM was held on 27 October 2021 after the completion of the SLGS Project day, and a new Executive Committee was elected. All these activities were conducted in an online platform.

The Newsletter also features outstanding achievements by two SLGS members— Professor Dharma Wijewickreme and Dr. Jayantha Ameratunga.

Three Geotechnical forums held in the months of July, September and October via Zoom with the active participation of many members are also featured in this issue of the Newsletter.

Dr. (Eng.) K. H. S. M. Sampath – Editor Newsletter

Contents

New Executive Committee elected for the year 2021—22

Details of the committee appointed for the year 2021-2022 is presented below.


Eng. K L S Sahabandu (President)


Dr. W A Karunawardena (Vice President)


Prof. S A S Kulathilaka (Past President)


Eng. K S Senanayake (Past President)


Prof. U P Nawagamuwa (Hony. Secretary)


Eng. (Mrs.) G DW N Galheana (Assistant Secretary)


Eng. W A A B Bandara (Treasurer)


Eng. R M Rathnasiri (Assistant Treasurer)


Dr. N H Priyankara (Editor- Journal)


Dr. K H S M Sampath (Editor- Newsletter)


Prof. H S Thilakasiri (Committee Member)


Dr. J S M Fowze (Committee Member)


Dr. L I N De Silva (Committee Member)


Dr. S. K. Navaratnarajah (Committee Member)


Eng. M D J P Wickramasooriya (Committee Member)

Standing from left:
Eng. RM Rathnasiri, Eng. MDJP Wickramasooriya, Eng. (Ms) GDWN Galhena, Dr. WA Karunawardena, Dr. JSM Fowze, Prof. HS Thilakasiri, Dr. KHSM Sampath, Dr. LIN De Silva

Seated from left:
Prof. UP Nawagamuwa, Prof. SAS Kulathilaka, Eng. KLS Sahabandu, Eng. KS Senanayake, Eng. WAAW Bandara.

Not in photograph:
Dr. NH Priyankara, Dr. SK Navaratnarajah.

SLGS Project Day—2021

The SLGS Project Day—2021 was held successfully on 27 October 2021, through an online platform via Zoom with submitted 15 research projects from Universities all over the country. Students presented their work done during their final year undergraduate research project, showcasing their enormous talent and potential on conducting quality research. Their research work has covered a vast area in the field of Geotechnical Engineering, particularly addressing current needs of the construction industry—spanning from optimizing geotechnical practices to developing new techniques.

The 4-6 page research papers and the final presentations were evaluated by a expert panel composed of Prof. UGA Puswewala, Eng. KLS Sahabandu, Eng. KS Senanayake, Dr. J. Ameratunge, Dr Asiri Karunawardena, Dr. JSM Fowze, Dr. HGPA Rathnaweera and Dr KHSM Sampath.

A brief summary of research work presented is listed below .

No	Authors	University	Research Title
1	B.B. Ashab, M.M.F. Banu and A. Anburuvel	University of Jaffna	Cost effective road base with crushed stone and waste tyre: An Investigation
2	A. Gowshikan and L.I.N. de Silva	University of Moratuwa	Effect of the depth and location of a shear key on the behaviour and stability of cantilever type retaining walls
3	A.A.S. Kaushalya and U.P. Nawagamuwa	University of Moratuwa	Development of an alternative approach for bored and cast in-situ pile design using PDA test results
4	C.N. Liyanage and L.I.N. de Silva	University of Moratuwa	A study on axial performance of helical piles on residual soils
5	R. Prasanna and S.A.S. Kulathilaka	University of Moratuwa	Use of the concept of capillary barriers to optimize the support systems of deep vertical excavations in unsaturated soils
6	R.I.A Rathnayaka and S.A.S. Kulathilaka	University of Moratuwa	Improvement of compressibility characteristics of waste material by dynamic compaction
7	K. Mathumidah, S. Lavanyan and M. C. M. Nasvi	University of Peradeniya	Stability analysis of Colombo-Katunayake Expressway (CKE) embankment using fly ash stabilized soil as embankment material
8	M.M.N.T. Meghasooriya, K.M.N.M. Jayarathna, and S.K. Navaratnarajah	University of Peradeniya	Pavement degradation model for road infrastructure in Sri Lanka
9	I.G.C.D. Dhanasekara and N.H. Priyankara	University of Ruhuna	Engineering behavior of gravel compaction piles (GCP) under drained condition
10	D.M.S.W. Dissanayake and N.H. Priyankara	University of Ruhuna	Variation of shear strength characteristics of Sri Lankan residual soils
11	M.A.G.P. Perera and N.H. Priyankara	University of Ruhuna	Shear strength characteristics of municipal solid waste in Meethotamulla dump site
12	A.Yoganathan and N.H. Priyankara	University of Ruhuna	Moderately loaded structures supported on soil-cement columns
13	S.H.L.T. Priyankara and W.M.N.R. Weerakoon	University of Sri Jayawardenapura	Strength mobilization in quarry dust mixed Sri Lankan dredged clays in early curing
14	K.M.D. Nimesha, N.A.N.M. Nissanka and M. C. M. Nasvi	University of Peradeniya	Prediction of geotechnical properties of stabilized soil using fly ash based stabilizer systems
15	G.A.N Jayaratne and H.S Thilakasiri	Sri Lanka Institute of Information Technology (SLIIT)	Prediction of post- construction settlement of road embankments

After an intense competition and a detailed evaluation, the panel has selected the champion and three runners-ups of SLGS Project Day 2021. The retails of the winners are as follows.

Rank	Authors	University	Research title
1	M.A.G.P. Perera N.H. Priyankara	University of Ruhuna	Shear strength characteristics of municipal solid waste in Meethotamulla dump site
2	C.N. Liyanage L.I.N. de Silva	University of Moratuwa	A study on axial performance of helical piles on residual soils
2	M.M.N.T. Meghasooriya K.M.N.M. Jayarathna S.K. Navaratnarajah	University of Peradeniya	Pavement degradation model for road infrastructure in Sri Lanka
2	K.M.D. Nimesha N.A.N.M. Nissanka M. C. M. Nasvi	University of Peradeniya	Prediction of geotechnical properties of stabilized soil using fly ash based stabilizer systems

Professor Dharma Wijewickreme honoured by the Canadian Geotechnical Society

Professor Dharma Wijewickreme has been recognized with the 2021 G. Geoffrey Meyerhof Award by the Canadian Geotechnical Society (CGS) for his "Outstanding Contributions to Soil Mechanics and Foundation Engineering."

Dr. Wijewickreme has built a distinguished research track record in earthquake and pipeline engineering since joining University of British Colombia (UBC) in 2001. He is internationally known for his research work on the earthquake response of silty soils and performance of buried pipelines subject to ground movement hazards.

During his previous 11-year tenure in industry practice as a Geotechnical Engineer, he contributed extensively to the seismic design and retrofit of several major highway bridges, pipeline systems, and large industrial plants.

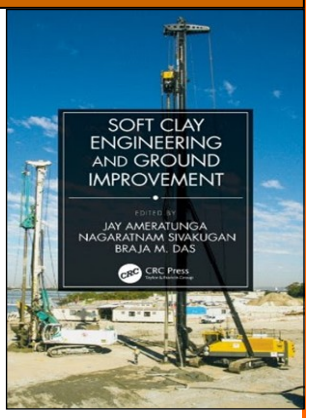
In 2015, Dr. Wijewickreme established the UBC Pipeline Integrity Institute (PII), with the vision to champion world-leading pipeline innovation and practices through advanced education, training, and applied research.

"I am honoured and humbled to receive this award; being able to work with, mentor, and train brilliant graduate students and see them become highly qualified professionals and contribute to Canada and the world, is massively rewarding," said Dr. Wijewickreme.

Dr. Wijewickreme's current research focuses on systematically understanding the complex effects of particulate structure on how soils behave during earthquakes. Dr. Wijewickreme served as the President of the Canadian Geotechnical Society for the two year period 2017-2018. He is a Fellow of the Canadian Academy of Engineering, Canadian Society for Civil Engineering, and Engineering Institute of Canada. In 2013, Dr. Wijewickreme became the recipient of the Canadian Society for Civil Engineering Horst Leipholz Medal for outstanding contributions to Engineering Mechanics and Practice in Canada.

Dr Wijewickreme has been a supporter of SLGS and was the co-author of a technical paper presented at the recent ICGE conference.

Geotechnical Engineering book by a Dr. Jayantha Amaratunga



The latest book on "**Soft Clay Engineering and Ground Improvement**" is a welcome addition to the subject of ground improvement which is becoming more important as marginal lands are subjected to rapid development. This book brings to fruition many hours of hard work and research done by the authors whose efforts are greatly recognized and acknowledged. The success of the book is derived from the collaborative efforts of its authors and their collective knowledge and experience gained over many years of practice and research in geotechnical engineering. The high standard of technical information provided will benefit many in this special area of study and work.

Dr Jayantha Ameratunga, the main author of the book, graduated in 1976 as a civil engineer from the University of Peradeniya and later obtained his Master's degree in geotechnical engineering from AIT (Asian Institute of Technology), an later a PhD from Monash University. He is a fellow of the Institution of Engineers Australia and Sri Lanka. He is currently residing in Australia.

Dr Ameratunga has had a varied professional career, beginning in Sri Lanka but mostly in Australia. In Sri Lanka, he worked with CDE (Ceylon Development Engineering) at the Bowatenna Power project site, later joining CECB in the design office. After his PhD, he worked at NBRO (National Building Research Organisation). In late 1989 he migrated to Australia and joined Coffey Geosciences, one of the leading geotechnical companies in Australia. He joined Golder Associates in 2018 before moving to Sri Lanka and working on the Central Expressway Project CEP1. Currently he is a Technical Executive at WSP. He has worked on many major projects across Australia, Sri Lanka, Singapore, Indonesia and the New Zealand. Several of his projects have won annual industry recognition awards.

Dr Ameratunga was the editor of the inaugural executive committee of SLGS (1986) under the leadership of Prof Thurairajah. Although residing in Australia, Jayantha has been very closely associated with the development of SLGS over the last 35 years.

Dr Ameratunga's co-author, Dr Sivakugan, is well known in the geotechnical fraternity. He has been the Head of Civil Engineering at James Cook University and is the author of several books on soil mechanics and foundation engineering.

It is also worthy to note that several of the chapter contributions in the book are from experienced Sri Lankan engineers currently working in Australia including Dr Kamal Dissanayake, Dr Satha Iyathurai, Thayalan Nall, and Dr Theva Muttuvel.

The book provides an in-depth analysis of geotechnical engineering principles related to soft soil engineering and ground improvement. It is intended to serve as a textbook for undergraduates, and a practical reference for researchers, academics and professional engineers.

SLGS Virtual Geotechnical Forum 2021

SLGS Virtual Geotechnical Forum by Dr. K H S M Sampath— July

Dr. K H S M Sampath
PhD, B.Sc., AMIE(SL)
Lecturer,
Department of Civil Engineering
University of Moratuwa

Rock Fluid Interaction: An Insight into Fluid Flow in Fractured Rocks

Geotechnical Forum for the month of **July 2021** was conducted online via Zoom by Dr. K. H. S. M. Sampath, Lecturer, Department of Civil Engineering, University of Moratuwa. The presentation discussed how the rock-fluid interaction causes the structural alterations in fractured rocks and how it affects the hydro-mechanical parameters of rocks, such as rock permeability and strength.

Further, the presentation explained how such alterations are visualized and quantified with micro computed tomography (Micro-CT) image-based analysis and how those complex coupled processes are numerically modelled with Discrete Fracture Matrix (DFM) modelling approach, incorporating fully coupled fluid flow—diffusion—adsorption—rock deformation processes.

SLGS Virtual Geotechnical Forums by Prof. H S Thilakasiri— September & October

Prof. H. S. Thilakasiri
PhD, DIC, FIE(SL), C.Eng.
Dean/Faculty of Engineering and
Senior Professor
Sri Lanka Institute of Information
Technology (SLIIT)

Geotechnical Forums for the months of **September and October 2021** were conducted online via Zoom by Prof. H. S. Thilakasiri, Dean/Faculty of Engineering and Senior Professor , Sri Lanka Institute of Information Technology (SLIIT). The enthusiasm shown by participants during Q&A sessions were really impressive even though the forums were held online. A brief summary of the presentations is given below.

Optimization of the Design of Rock Socketed Bored and Cast In-Situ Piles

The presentation covered optimization of the current design practices of rock socketed bored piles in Sri Lanka, covering the estimation of ultimate skin friction of piles in soil and rock mediums, estimation of allowable end bearing capacity of the bedrock, and relevant field verifications.

Testing of Piles

The presentation was done as a continuation of the previous geo forum which was conducted in September 2021. The presentation covered the field applications of dynamic (PDA) and static load testing (MLT and IMLT) of piles and their relative advantages, commonly used integrity testing methods such as PIT and CSL of piles and their relative merits, and use of methods such as Thermal Integrity Profiling (TIP).

The 3rd International Conference on Geotechnical Engineering (ICGEColombo—2020)

ICGEColombo2020 - The third International Conference organized by the Sri Lankan Geotechnical Society (SLGS) was very successfully conducted on 6-7 December 2021 on a virtual platform.

The conference was staged under the theme of

"Geotechnics in a Challenging Environment".

The conference was conducted from Cinnamon Grand Colombo with organizers being present there and all the participants from Sri Lanka and all over globe joining online. Presentations were pre-recorded but there were interactive live discussions after the presentations.

Inaugural session had welcome speeches from President SLGS and Co-Chair ICGEC2020 – Eng. K L S Sahabandu, Immediate Past President and Co-Chair ICGEC2020 – Prof. Athula Kulathilaka and President - ISSMGE – Prof. W W Ng Charles. There was a short video clip on the history of SLGS. Conference Secretary - Dr. J S M Fowze proposed the vote of thanks.

There were five keynote lectures, two on day one and three on day two. Keynote lectures were delivered by; Prof. W W Ng Charles, Prof. Buddhima Indraratna, Dr. Brian Simpson, Dr. Chris Haberfield and Prof. Krisna Reddy. The details are as follows.

⇒ Unsaturated Soil Mechanics and Bioengineered Soil Slopes with a Focus on Hydrological Effects by **Prof Charles W W Ng,** Hong Kong University of Science and Technology

⇒ Ground Improvement for Rail and Road Infrastructure by **Distinguished Prof Buddhima Indraratna,** University of Technology Sydney

⇒ Lessons Learned from Failures of Embedded Retaining walls by **Dr Brian Simpson**, Arup Fellow Principal of Arup Geotechnics and Honorary Professor at the University of Nottingham, UK

⇒ Foundation Investigation, Analysis and Design for High Rise Buildings by **Dr. Chris Harberfield** Principal, Golder Associates, Australia.

⇒ Modeling Coupled Dynamic Processes in Landfills: Holistic Long-Term Performance Management to Improve Sustainability by Professor **Krishna Reddy**, University of Illinois at Chicago

Conference was conducted with three parallel sessions on day one and two parallel sessions on day two. There were sessions on;

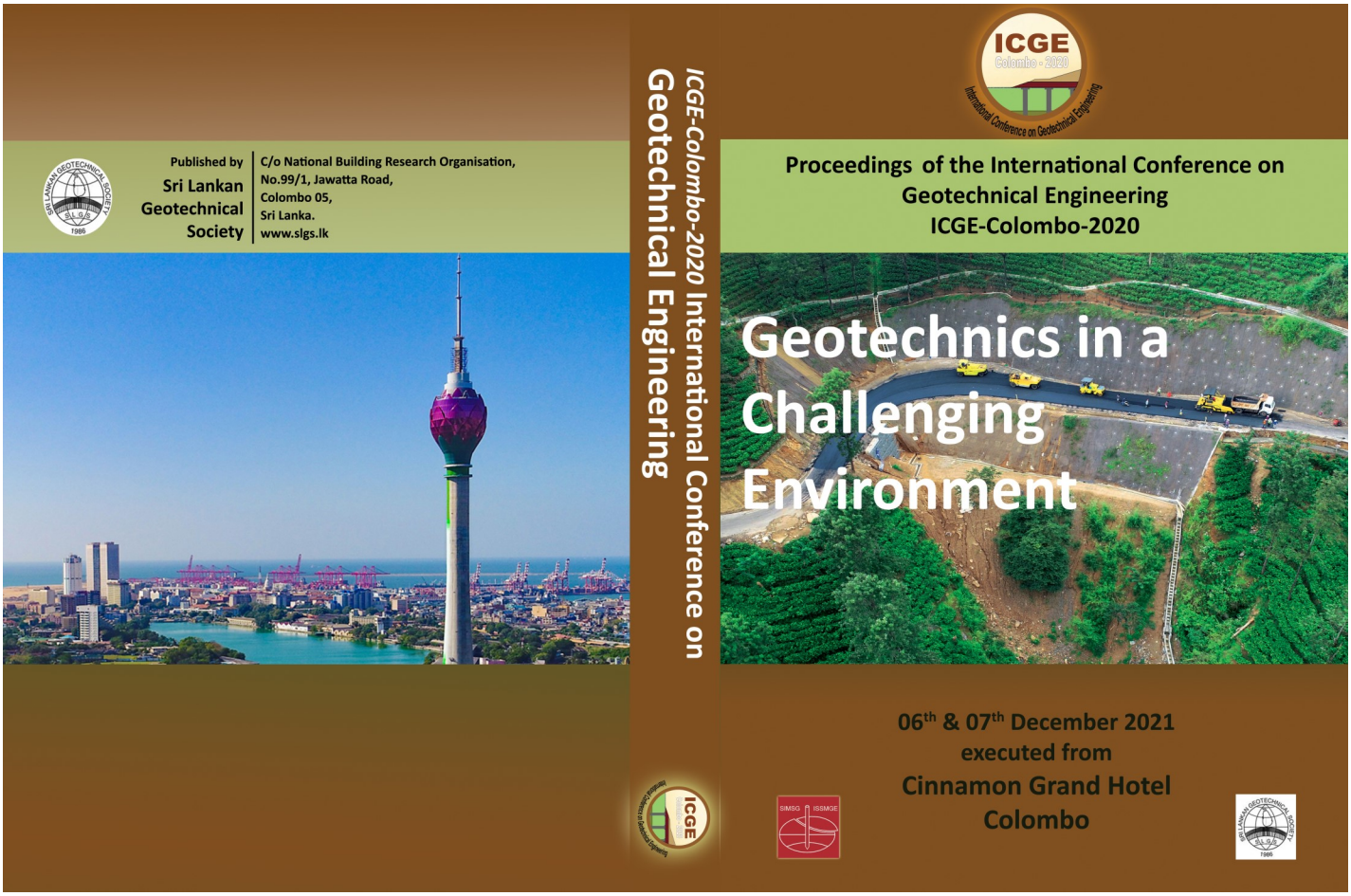
- Transport Geotechnics
- Landslides and Slope Stability
- Ground Improvements
- Site Investigation
- Foundations, Geosynthetics and Case Histories
- Environmental Geotechnics
- Problematic soils
- Analytical and Numerical Modelling

Altogether there were 96 presentations.

The Proceedings which included the keynote lectures and all the accepted papers and the conference handbook were shared with the registered participants through a google drive link.

Also they will be available in the ISSMGE Library.

We are hopeful that conference will be a turning point in the field of geotechnical engineering with new encouragement for development of innovative techniques and well directed research to address geotechnical engineering challenges faced by the country.



Some Glimpse of the ICGEColombo—2020

Ex. Co. Members Lighting the Oil Lamp to Commence the Conference

President, Immediate Past President, Conference Secretaries and Treasurer at the Head Table

Welcome Address by the President of SLGS Eng. K L S Sahabandu

Co-Chair Prof. Athula Kulathilaka Addressing the Conference

From the Presentation on History of SLGS

Opening Remarks by from Prof. Charles W W Ng. – President – ISSMGE

Vote of Thanks by Conference Secretary Dr. J S M Fowze

Vice President SLGS Dr. Asiri Karunawardena introducing Prof. W.W. Ng. Charles

Secretary SLGS Prof. Udeni Nawagamuwa introducing Prof. Buddhima Indraratna

Dr. Nalin De Silva Introducing Dr. Brian Simpson

Dr. Nadeej Priyankara Introducing Prof. Krishna Reddy

Dr. Sampath Hewage Introducing Dr. Chris Haberfield

Some Glimpse of the ICGEColombo—2020

Conference Executed from Cinnamon Grand

Backdrop with Sponsors Logos

Webcasting the Conference

Teatime

Conference Support Group